Table C.4-9. Preliminary accident review of alternative process elements.

Process elements / HLW Option	NWCF Continued Operations	NWCF Hi-Temp & MACT Mods	Long Term On-Site Storage of SBW	Calcine Retrieval & On-Site Transport	SBW Retrieval & On-Site Transport	Separation	Class C Grout	Borosilicate Vitrification	HLW/SBW Immobilization for Transport (e.g., FUETAP, HIP, Polymer)	Liquid Waste Stream Evaporation	Additional Offgas Treatment	Class C Grout Disposal	LLW, MLLW Disposal	HLW On-Site Storage for Transport	Long Term On-Site Storage of Calcine in Bin Sets	HLW/HAW/SBW Stabilization & Preparation for Transport	TRU Stabilization & Preparation for Transport	TRU On-Site Storage	INTEC Infrastr. / Lab Upgrades, Hanf Vit Activities, NGR or WIPP Shipment / Disposal
Process Element Designator	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18	
Separations Alternative																			
Full Separations Option				IIC	IIA	IC	IIIB	IC		IB	IIB		IIIB	IIIC		IIIC			Not Part of AA
Planning Basis Option	IB	IIC		IIC	IIA	IC	IIIB	IC		IB	IIB		IIIB	IIIC		IIIC			Not Part of AA
Transuranic Separations Option				IIC	IIA	IC	IIC			IB	IIB	IIB					IIB	IIIA	Not Part of AA
Non-Separations Alternative																			
Hot Isostatic Pressed Waste Option	IB	IIC		IIC	IIA				IC	IB	IIB		IIIC	IIIC		IIIC	IIB		Not Part of AA
Direct Cement Waste Option	IB	IIC		IIC	IIA				IC	IB	IIB		IIIC	IIIC		IIIC	IIB		Not Part of AA
Early Vitrification Option				IIC	IIA			IC			IIB		IIIC	IIIC		IIIC	IIIB	IIIA	Not Part of AA
Minimum INEEL Processing Alternative																			
Minimum INEEL Processing				IIC	IIA	IIC	IIC		IIC		IIB			IIC		IIB	IIB	IIIA	Not Part of AA
No ActionAlternative																			
No-Action			IIC	IIC											IB				
Continued Current Operations Alternative																			
Continued Current Operations	IB	IIC		IIC	IIA	IIC				IIB					IB		IIB		

Requires evaluation of accidents that includes systematic scenario identification, estimation of accident frequencies, estimation of accident source terms.

Does not require evaluation for bounding accidents based on currently available information.

Table C.4-10. Accident evaluations required.

HLW Option / Process elements	NWCF Continued Operations	NWCF Hi-Temp & MACT Mods	Long Term On-Site Storage of SBW	Calcine Retrieval & On-Site Transport	SBW Retrieval & On-Site Transport	Separation	Class C Grout	Borosilicate Vitrification	HLW/SBW Immobilization for Transport (e.g., FUETAP, HIP, Polymer)	Liquid Waste Stream Evaporation	Additional Offgas Treatment	Class C Grout Disposal	LLW, MLLW Disposal	HLW On-Site Storage for Transport	Long Term On-Site Storage of Calcine in Bin Sets	HLW/HAW/SBW Stabilization & Preparation for Transport	TRU Stabilization & Preparation for Transport	TRU On-Site Storage
Process Element Designator	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18
Separations Alternative																		
Full Separations Option				AA3	AA24	AA4		AA8		AA14	AA15							
Planning Basis Option	AA1	AA2		AA3	AA24	AA4		AA8		AA14	AA15						AA21	
Transuranic Separations Option				AA3	AA24	AA5	AA7			AA14	AA15	AA16					AA21	
Non-Separations Alternative																		
Hot Isostatic Pressed Waste Option	AA1	AA2		AA3	AA24				AA11	AA14	AA15						AA21	
Direct Cement Waste Option	AA1	AA2		AA3	AA24				AA12	AA14	AA15						AA21	
Early Vitrification Option				AA3	AA24			AA9			AA15					AA23		
Minimum INEEL Processing Alternative																		
Minimum INEEL Processing Alternative				AA3	AA24	AA6	AA7		AA10		AA15			AA17		AA18	AA21	
No Action Alternative																		
No Action Alternative			AA22	AA3											AA20			
Continued Operations Alternative																		
Continued Operations Alternative	AA1	AA2		AA3	AA24	AA6				AA14					AA20		AA21	

[Shaded box] Requires evaluation of accidents that includes systematic scenario identification, estimation of accident frequencies, estimation of accident source terms.

[Unshaded box] Does not require evaluation for bounding accidents based on currently available information.

Table C.4-11. Potentially bounding abnormal radiological events.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 01	Fuel fire in calciner cell	This scenario is initiated by a kerosene spill-in the calciner cell. The products of combustion from a fire will degrade the HEPA filters in the ventilation system and release accumulated radionuclides on the filters.	The fuel fire is of sufficient magnitude to impact and degrade the HEPA filters. The HEPA filter activity data from the NWCF SAR is applicable. Radioactive inventories in other sections of the calciner cell are not assumed to be impacted. The source term is modeled as a fire-involving material on HEPA filters with corresponding release fraction data from DOE-STD-3010 (DOE 1994). The HEPA filter failure is assumed to result in a direct leak path to the environment. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. The source term was decayed to 2000.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Operations Alternative.
ABN 02	Kerosene leak through failed process connections	This accident resulted in a chemical release rather than a radiological release.	NA	NA
ABN 03	Bin set #2 cyclone housing failure	This scenario is initiated by failure of the bin set #2 cyclone housing by abnormal loads. This scenario could occur from earthquakes or human error. The bin set #2 cyclone housing presently contains about 1m^3 of calcine. The calcine released to the environment as a result of such a failure will be able to migrate away from the source and impact the environment.	The entire content of the bin set #2 cyclone housing is released and 40% of the calcine released is fines. Source term developed assuming potential inventory is the entire contents of the bin set #2 cyclone housing. Radioactive inventories in other sections of the bin sets are assumed to not be impacted. Radiological inventories based on bin set #1 activities because bin set #1 represents the highest inventory of all bin sets. The cyclone failure would create an open pathway to the atmosphere. During normal operation, the contents of the bin sets cyclone housing do not have direct access to the environment. Source term was decayed to 2016.	Full Separations Option; Planning Basis Option; TRU Separations Option; Hot Isostatic Pressed Waste Option; Direct Cement Waste Option; Early Vitrification Option; Minimum INEEL Processing Alternative; No Action Alternative; and Continued Operations Alternative.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 04	Ion exchanger toxic release	This accident resulted in a chemical release rather than a radiological release.	NA	NA
ABN 05	Explosion from reaction of incompatible chemicals	This scenario is postulated to be initiated by human error or inadequate procedures during the chemical adjustment of SBW entering the separations process that results in the mixing of incompatible chemicals and results in a potentially energetic exothermic reaction. Consequences include release of SBW to material confinement.	The reaction breaches the process piping; the spill volume is assumed to be equivalent to the volume of one high-activity waste (HAW) surge tank (73 m^3 or 19,290 gal); operators take appropriate actions to terminate process flow after the explosion; all of the material spilled participates in the release; the release will be filtered by at least one stage of HEPA filtration with an efficiency of 99.95%; the cited source term value is appropriate for free fall spills of aqueous solutions; during normal operation, the contents of the Separations Facility do not have direct access to the environment; and source term was decayed to 2015.	TRU Separations Option.
ABN 06	Ion exchanger toxic release of hydrogen cyanide vapor	This accident resulted in a chemical release rather than a radiological release.	NA	NA
ABN 07	An electrical panel or motor fire in the Class C Grout process causes degradation of exhaust HEPA filters	This scenario is postulated to be initiated by an electrical panel or motor fire in the Class C Grout Facility. The equipment in the Grout Facility will be impacted to some extent because it was not designed to withstand the consequences of a fire. The products of combustion from a fire could degrade the HEPA filters in the ventilation system and release accumulated radionuclides.	The fire is of sufficient magnitude to impact the HEPA filters; source term developed assuming a fire impacting the radionuclide inventory on the HEPA filters after one year of accumulation. Radioactive inventories in other sections of the facility are assumed to not be impacted; the HEPA filter failure is assumed to result in a direct leak path to the environment; during normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment; source term was decayed to 2015.	Transuranic Separations Option and Minimum INEEL Processing Alternative.

Table C.4-11. Potentially bounding abnormal radiological evens (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 08	Melter insulation fire causes a HEPA filter failure	Electrical equipment failure initiates a fire in the melter insulation and causes equipment failures and loss of power. Melter heater controller fails in the "energized" condition. An insulation fire could generate massive amounts of smoke, which could overload and possibly collapse the heating, ventilation, and air conditioning (HVAC) HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The fire is of sufficient magnitude to impact the HEPA filters; source term developed assuming a fire impacting the radionuclide inventory on the HEPA filters after one year of accumulation. Radioactive inventories in other sections of the facility are assumed to not be impacted; the HEPA filter failure is assumed to result in a direct leak path to the environment; during normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment; source term was decayed to 2015.	Full Separations Option and Planning Basis Option.
ABN 09	Melter insulation fire causes a HEPA filter failure	Electrical equipment failure initiates a fire in the melter insulation and causes equipment failures and, loss of power. Melter heater controller fails in the "energized" condition. An insulation fire could generate massive amounts of smoke, which could overload and possibly collapse the HVAC HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The fire is of sufficient magnitude to impact the HEPA filters; source term developed assuming a fire impacting the radionuclide inventory on the HEPA filters after one year of accumulation. Radioactive inventories in other sections of the facility are assumed to not be impacted; the HEPA filter failure is assumed to result in a direct leak path to the environment; during normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment; and source term was decayed to 2015.	Early Vitrification Option.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 10	Electrical panel/motor fire causes a HEPA filter failure	Electrical equipment failure initiates a fire, which causes equipment failures and loss of power. An electrical panel/motor fire could generate smoke, which could overload and possibly collapse the HVAC HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The radioactive inventory of the filters distributed between 3 sets of 2-stage filters with each having an efficiency rating of 0.9995. The filters have been in operation for 1 year. Radioactive inventories in other sections of the Waste Packaging Facility are assumed to not be impacted. The HEPA filter failure would create an open pathway to the atmosphere. During normal operation, the contents of the Waste Packaging Facility do not have direct access to the environment. Source term was decayed to 2011.	Minimum INEEL Processing Alternative.
ANB 11	HIP machine insulation fire causes a HEPA filter failure	Electrical equipment failure initiates a fire in the HIP machine insulation and causes equipment failures and loss of power. HIP machine heater controller fails in the "energized" condition. An insulation fire could generate massive amounts of smoke, which could overload and possibly collapse the HVAC HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The fire is of sufficient magnitude to impact the HEPA filters. Source term developed assuming a fire impacting the radionuclide inventory on the HEPA filters after one year of accumulation. Radioactive inventories in other sections of the facility are assumed to not be impacted. The HEPA filter failure is assumed to result in a direct leak path to the environment. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. Source term was decayed to 2015.	Hot Isostatic Pressed Waste Option.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 12	Autoclave insulation fire causes a HEPA filter failure	Electrical equipment failure initiates a fire in the autoclave insulation and causes equipment failures and loss of power. Autoclave heater controller fails in the "energized" condition. An insulation fire could generate massive amounts of smoke, which could overload and possibly collapse the HVAC HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The fire is of sufficient magnitude to impact the HEPA filters. Source term developed assuming a fire impacting the radionuclide inventory on the HEPA filters after one year of accumulation. Radioactive inventories in other sections of the facility are assumed to not be impacted. The HEPA filter failure is assumed to result in a direct leak path to the environment. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. Source term was decayed to 2015.	Direct Cement Waste Option.
ABN 13	Electrical panel/motor fire causes a HEPA filter failure	Electrical equipment failure initiates a fire, which causes equipment failures and loss of power. An electrical panel/motor fire could generate smoke, which could overload and possibly collapse the HVAC HEPA filters. This could release the radioactive material trapped in the filters, as well as any radioactive material suspended in the building atmosphere, to the environment.	The radioactive inventory of the filters distributed between 3 sets of 2-stage filters with each having an efficiency rating of 0.9995. The filters have been in operation for 1 year. Radioactive inventories in other sections of the Waste Packaging Facility are assumed to not be impacted. The HEPA filter failure would create an open pathway to the atmosphere. During normal operation, the contents of the Waste Packaging Facility do not have direct access to the environment. Source term was decayed to 2011.	Minimum INEEL Processing Alternative.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 14	Leak from high activity waste surge tank	This scenario is initiated by a leak from the high-activity waste surge tank through failed process connections. A portion of the spilled material could be entrained as aerosol droplets in the vault ventilation and subsequently be released to the environment.	The released inventory is the volume of one high-activity waste surge tank (19,290 gallons). The activity/ radiological inventory in the high-activity waste surge tanks is assumed to be the same as the high-activity waste evaporator feed stream. The bounding condition is assumed to be based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. At least one stage of HEPA filtration will be unaffected by the scenario and provide filtration to 99.95% efficiency prior to release to the environment. The source term is modeled as a spill involving an aqueous solution with corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term was decayed to 2016.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, and Transuranic Separations Option.
ABN 15	Ammonia tank faillure	This accident resulted in a chemical release rather than a radiological release.	NA	NA
ABN 16	Failure of the Class C grout transfer line	This scenario is initiated by an unknown event that causes failure of the Class C grout transfer line, which would result in the loss of grout to the environment. The maximum material at risk is considered to be the maximum volume of grout pumped (2000 gal/hr) for a 1-hour period. The grout released to the environment as a result of such a failure will be able to migrate away from the source and impact the environment.	The radioactive inventory is the volume released to the environment during a piping failure that remains undetected for 1 hour (2,000 gallons). The entire quantity of grout is spread on the surface of the ground. The escaped grout solidifies very rapidly. The piping failure results in the wet grout being pumped directly to the surface of the ground, outside of any confinement. There is no energy source available to suspend additional material. During normal operations, the entire Class C grout transfer system does not have direct access to the environment. Source term was decayed to 2015.	Transuranic Separations Option.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 17	Spill of material during canister filling	This scenario is initiated by a spill of material during canister filling operations. This could occur due to misalignment of the canister with the fill nozzle or overfilling of the canister. Some of the spilled material will be entrained in the ventilation system and exhausted into the environment, with potential consequences to the co-located workers and public.	The spilled inventory is equivalent to a spill from an operation proceeding at the maximum calcine retrieval rate (2,700 kg/hr) over an 8-hour shift. The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free-fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term was decayed to 2016.	Minimum INEEL Processing Alternative.
ABN 18	Spill of material during canister filling	This scenario is initiated by a spill of material during canister filling operations. This could occur due to misalignment of the canister with the fill nozzle or overfilling of the canister. Some of the spilled material will be entrained in the ventilation system and exhausted into the environment, with potential consequences to the co-located workers and public.	The operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr) and the spill is undetected for an 8-hour shift. The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free-fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term was decayed to 2016.	Minimum INEEL Processing Alternative.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 19	Spill of material during canister filling	This scenario is initiated by a spill of material during canister filling operations. This could occur due to misalignment of the canister with the fill nozzle or overfilling of the canister. Some of the spilled material will be entrained in the ventilation system and be exhausted into the environment with potential consequences to the co-located workers and public.	The consequences from the calcine operation bound the consequences from the SBW operation. The operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr), and the spill is undetected for an 8-hour shift. The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free-fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term was decayed to 2016.	Minimum INEEL Processing Alternative.
ABN 20	Failure of bin set #1 structure	This scenario is initiated by a partial failure of a bin set as a result of a structural failure. Over many years, especially after the site is no longer under the jurisdiction of the DOE, the probability of a structural failure increases as tank monitoring is no longer performed and the tank ages. There is a potential that the released material could be exposed to the ground surface and get entrained in the air stream. This scenario is relatively likely after 2095 after the site is no longer under government control since monitoring systems and maintenance requirements would no longer be met.	A partial failure in one of the four bins in bin set #1 is postulated. Approximately 1% of the contents of 1 of the 4 bins is released. 40% of the calcine released is fines. The spilled material is exposed directly at the ground surface. The source term is modeled as the entrainment of powder in the air flow over the spill. The release fraction data from DOE-STD-3010 (DOE 1994) indicate that the airborne resuspension rate for powder is 4×10^{-5}/hr and the respirable fraction is 1.0. The spill is not contained and controlled in a manner such that the spilled material is shielded from the wind for a period of 30 days. Source term decayed to 2095.	Continued Operations Alternative and No Action Alternative.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 21	A remote handled waste isolation pilot plant container drops and breaks open causing a spill	The forklift or crane operator drops a cask during transport. If operations personnel forget to fasten a cask lid so that if a cask is dropped material can spill out, or a cask drop occurs during transport within the transfer operations due to equipment failure or operator error, then localized consequences would result.	Only the material on the surface area of the unsolidified grout container is subject to material release. The facility structure and the ventilation system remains intact. During normal operations, the RH-TRU Stabilization and Preparation Facility does not have direct access to the environment. Source term decayed to 2015.	Continued Operations Alternative, Transuranic Separations Option, Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Minimum INEEL Processing Alternative.
ABN 22	Accident intrusion	Intrusion by unauthorized persons unprepared for contact with radioactive materials, from one or more tank results in significant exposures and potential groundwater release of materials.	Ten percent of the contents of the fullest pillar-and-panel tanks is released to the environment. Source term developed assuming radioactive inventory is the fullest of the five pillar-and-panel tanks. Radioactive inventories in other tanks in the tank farm are assumed to not be impacted. The vault failure would create an open pathway to subsurface soil with subsequent impact to groundwater. Since the spill is in liquid form, it is assumed that there is great downward mobility. Therefore, there is no airborne release for this scenario. Source term decayed to 2095.	No Action Alternative.
ABN 23	A dropped cask causes a release to the building interior	A forklift or crane operator dropping a cask during transport, which would result in the loss of material confinement, initiates this scenario. This scenario could occur if operations personnel forgot to fasten a cask lid and the vitrified SBW within the cask had not set-up prior to the accident. The spill of one cask within the SBW Packaging and Preparation Building will result in localized consequences.	The entire content of one RH-WIPP container is released to the facility interior. Only 50% of the molten SBW spills from the container. Radioactive inventories in other containers are not impacted. During this scenario, the content of the spilled container does not have direct access to the environment. Source term decayed to 2015.	Early Vitrification Option.

Table C.4-11. Potentially bounding abnormal radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 24	Failure of SBW collection tank in solidification facility	A spill of liquid SBW occurs due to collection tank failure from an unknown cause. The result is a localized consequence considered to be the contents of the SBW released will not be able to migrate away from the source and impact the environment.	The entire content of one of the two SBW receiving tanks is released to the interior of the facility. All other systems remain operational. The tank failure occurs on the tank bottom so the entire contents are drained. The ventilation system HEPA filters remain operational and the facility is intact. During normal operation, the contents of the collection tank vault do not have direct access to the environment. Source term decayed to 2015.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 01	Fuel explosion in calciner vessel	This scenario is initiated by a build up of excess fuel in the calciner bed followed by ignition causing a "roman candle" explosion and concurrent failure of the HEPA filtration system.	The calciner cell activity data from the NWCF SAR is applicable. The calciner cell activity is assumed to be the same as the calciner vessel activity. No credit is taken for the HEPA filter. The building is no longer leak tight. The spill involves the calcined product and the release properties for a powder explosion per DOE-STD-3010 (DOE 1994) are applicable. Source term decayed to 2000.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Operations Alternative.
DBE 02	Carbon bed filter fire	Inadequate nitrous oxide destruction in the reduction chamber of the multi-stage combustion system leads to exothermic reactions in the filter bed. The heat buildup could result in a fire and a release of radioactive material (I-129) and mercury embedded in the filter bed.	The amount of I-129 trapped in the mercury filters is 6.2 kg (0.78 Ci). All of the I-129 is assumed to be available for release. Approximately 10% of the material is released into the surrounding area. Of that, 10% is released to the environment. No credit is taken for additional HEPA filtration. Source term decayed to 2011.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Operations Alternative.
DBE 03	A flood causes failure of bin set #1	This scenario is initiated by a flood, which would result in a buckling failure of the bin set #1 vault and severe, immediate, and catastrophic consequences with the floodwaters filling the bin set confinement and causing the bin contents to mix with floodwaters in the vault. The calcine released could be brought to the surface where it would be exposed to the sunlight and dried.	10% of the contents of 1 of the 4 bins that comprise bin set #1 is released. In addition, it is assumed that 40% of the calcine released is fines. The spilled material is exposed directly at the ground surface. The source term is modeled as the entrainment of powder in the air flow over the spill. The release fraction data from DOE-STD-3010 (DOE 1994) indicate that the airborne resuspension rate for powder is 4×10^{-5}/hr. The spill is not contained and controlled in a manner such that the spilled material is shielded from the wind for a period of 30 days. Source term decayed to 2000.	No Action Alternative, Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 04	Organic-oxidant (red-oil) explosion during solvent treatment in the transuranic extraction or strontium extraction separations process results in failure of confinement	This scenario is postulated to be initiated by an organic-oxidant (red-oil) explosion during solvent treatment or evaporation of aqueous process streams containing solvents in the TRUEX or SREX separation processes that results in release of a significant quantity of radioactive and chemically hazardous material and simultaneous failure of operational confinement.	The explosion damages the three HAW surge tanks (73 m^3 or 19,290 gal each). The activity/radiological inventory in the HAW surge tanks is the same as the evaporator feed stream. The condition is based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. All of the material is spilled from the tanks. The source term is appropriate for boiling aqueous solutions. Source term decayed to 2016.	Full Separations Option and Planning Basis Option.
DBE 05	Organic-oxidant (red-oil) explosion during solvent treatment in the transuranic extraction separations process results in failure of confinement	This scenario is postulated to be initiated by an organic-oxidant (red-oil) explosion during solvent treatment or evaporation of aqueous process streams containing solvents in the TRUEX separation processes that results in release of a significant quantity of radioactive and chemically hazardous material and simultaneous failure of operational confinement.	The explosion damages the three HAW surge tanks (73 m^3 or 19,290 gal each). The activity/radiological inventory in the HAW surge tanks is the same as the TRUEX strip stream. The condition is based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. All of the material is spilled from the tanks. The source term is appropriate for boiling aqueous solutions. Source term decayed to 2015.	Transuranic Separations Option.
DBE 06	Liquid waste system failure with degradation of HEPA filtration	This scenario is initiated by a break in the liquid waste system that could result in flooding of equipment, release of materials to confinement, and if wetted, degraded functioning of the HEPA filtration system.	Failure of one of the two waste feed tanks for the Cs ion exchange system. The tank fails while filled to capacity. The activity/radiological inventory of the dissolved calcine stream bounds the SBW stream. All of the material spilled participates in the release. The filter wetting impairs the HEPA filters. The source term value is appropriate for free fall spills of aqueous solutions. The HEPA filter failure would create an open pathway to the atmosphere. Source term decayed to 2009.	Continued Operations Alternative and Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 07	A seismic event causes failure of the denitrated solids feed vessel and facility structure	This scenario is initiated by a design basis seismic event which causes failure of the Class C Grout Facility structure and equipment which would result in the failure of the denitrated solids feed vessel and the loss of the primary and secondary vault containment barriers. The maximum material at risk is considered to be the maximum feed case, which is SBW and zirconia calcine prior to grouting.	The entire inventory of denitrated solids is released to the Class C Grout Facility non-containment area and 30% of the calcine released is in the respirable range. Source term developed assuming radioactive inventory is the entire contents of the denitrated solids containment vessel. The vault failure would create an open pathway to the atmosphere. During normal operation, the contents of the Class C Grout Facility do not have direct access to the environment. Source term decayed to 2015.	Transuranic Separations Option and Minimum INEEL Processing Alternative.
DBE 08	Steam explosion causes catastrophic melter failure	A steam explosion occurs in the borosilicate vitrification melter due to intrusion of water into the melter cell, which causes a catastrophic failure of the melter and release of vitrified waste material.	The steam explosion ruptures the melter and the entire contents of the melter are spilled in the melter cell. The explosion is of sufficient force to breach the Borosilicate Vitrification Facility. The radioactive inventory is assumed to be the contents of the operating melter. During normal operation, the content of the melter does not have direct access to the environment. Source term decayed to 2015.	Full Separations Option and Planning Basis Option.
DBE 09	Steam explosion causes catastrophic melter failure	A steam explosion occurs in the borosilicate vitrification melter due to intrusion of water into the melter cell, which causes a catastrophic failure of the melter and release of vitrified waste material.	The steam explosion ruptures the melter and the entire contents of the melter are spilled in the melter cell. The explosion is of sufficient force to breach the Borosilicate Vitrification Facility. The radioactive inventory is assumed to be the contents of the operating melter. During normal operation, the content of the melter does not have direct access to the environment. Source term decayed to 2015.	Early Vitrification Option.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 10	Chemical release nearby causes incapacitation or evacuation with equipment failure	Assuming the ventilation system is not designed to protect the facility from externally generated hazardous gases/materials, enough of a passing toxic chemical cloud of sufficient concentration could be drawn into the building through the ventilation system requiring personnel evacuation or causing personnel incapacitation.	The radioactive inventory of the filters distributed between 3 sets of 2-stage filters. The filters have been in operation for one year. Radioactive inventories in other sections of the Waste Packaging Facility are not impacted. The HEPA filter failure would create an open pathway to the atmosphere. During normal operation, the contents of the Waste Packaging Facility do not have direct access to the environment. Source term decayed to 2011.	Minimum INEEL Processing Alternative.
DBE 11	Hot isostatic press vessel ruptures and causes catastrophic failure of the hot isostatic press machine	A HIP Vessel rupture occurs in a HIP machine at nominal HIP conditions due to improper vessel manufacture, causing catastrophic failure of the HIP machine and release of blended calcine waste material.	The HIP Vessel failure causes the HIP can being processed to fail so that 10% of the contents of the can are ejected, of which 70% of the calcine is fines (the force of the explosion will create more fines). The explosion is of sufficient force to breach the facility. The radioactive inventory is assumed to be the contents of one HIP can. During normal operation, the content of the HIP machine does not have direct access to the environment. Source term decayed to 2015.	Hot Isostatic Pressed Waste Option.
DBE 12	Autoclave explosion causes catastrophic autoclave failure	An autoclave explosion occurs at nominal autoclave conditions due to improper vessel manufacture and causes catastrophic failure of the autoclave and release of blended calcine grout material.	The explosion ruptures the autoclave and releases blended calcine grout material. The explosion is of sufficient force to breach the facility. The radioactive inventory is assumed to be the contents of one canister. During normal operation, the content of the Direct Cementitious Waste Process does not have direct access to the environment. Source term decayed to 2015.	Direct Cement Waste Option.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 13	Chemical release nearby causes incapacitation or evacuation with equipment failure	Assuming the ventilation system is not designed to protect the facility from externally generated hazardous gases/materials, enough of a passing toxic chemical cloud of sufficient concentration could be drawn into the building through the ventilation system requiring personnel evacuation or causing personnel incapacitation.	The radioactive inventory of the filters distributed between 3 sets of 2-stage filters. The filters have been in operation for one year. Radioactive inventories in other sections of the Waste Packaging Facility are assumed to not be impacted. The HEPA filter failure would create an open pathway to the atmosphere. During normal operation, the contents of the Waste Packaging Facility do not have direct access to the environment. Source term decayed to 2011.	Minimum INEEL Processing Alternative.
DBE 14	Organic-nitric acid (red-oil) explosion	This scenario is initiated by an organic-nitric acid (red-oil) explosion in the evaporator. This could occur if the fugitive organics from upstream operations reacted with nitric acid.	The released inventory is the volume of three HAW surge tanks (19,290 gallons, each, or 57,870 gallons, total). The activity/radiological inventory in the HAW surge tanks is assumed to be the same as the HAW Evaporator feed stream. The condition is assumed to be based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. At least one stage of HEPA filtration will be unaffected by the scenario. The source term is modeled as a boiling aqueous solution with corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, and Hot Isostatic Pressed Waste Option.
DBE 15	Ammonia tank failure	This accident analysis resulted in a chemical release rather than a radiological release.	NA	NA

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 16	A seismic event causes failure of the Class C grout transfer line	This scenario is initiated by a design basis seismic event that causes failure of the Class C grout transfer line, which would result in the loss of grout to the environment. The maximum material at risk is considered to be the maximum volume of grout pumped (2000 gal/hr) for a 1-hour period.	The radioactive inventory is the volume released to the environment during a piping failure that remains undetected for 1 hour (2,000 gallons). The escaped grout solidifies very rapidly. The piping failure results in the wet grout being pumped directly to the surface of the ground, outside of any confinement. There is no energy source available to suspend additional material. During normal operations, the entire Class C grout transfer system does not have direct access to the environment. Source term decayed to 2015.	Transuranic Separations Option.
DBE 17	Spill of multiple canisters during transport	This scenario is initiated by a spill of multiple canisters during transport. Some of the spilled inventory will be entrained into the ventilation system and exhausted into the environment.	All three canisters are impacted and that one of the three canisters is spilled. It is assumed that the operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 18	Spill of multiple canisters during transport	This scenario is initiated by a spill of multiple canisters during transport. Some of the spilled inventory will be entrained into the ventilation system and exhausted into the environment.	All three canisters are impacted and that one of the three canisters is spilled. It is assumed that the operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.
DBE 19	Spill of multiple canisters during transport	This scenario is initiated by a spill of multiple canisters during transport. Some of the spilled inventory will be entrained into the ventilation system and exhausted into the environment.	Only the calcine operation is considered in the source term development. All three canisters are impacted and that of the three canisters is spilled. It is assumed that the operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The HEPA filtration system is in operation and is 99.95% effective in filtering out particulate material. The inventory data is based on the contents of bin set #1. The source term is modeled as a free fall spill of powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 20	A seismic event causes failure of bin set #5	This scenario is initiated by a seismic event, which would result in buckling and failure of the bin set #5 vault and severe, immediate, and catastrophic consequences as the bin set bin contents escape into the environment. The maximum material at risk is considered to be the contents of bin set #5.	10% of the contents of 2 of the 7 bins that comprise bin set #5 is released. 40% of the calcine released is fines. Rubble covering the tank limits its contents from getting into the environment. The spilled material is exposed directly at the ground surface. The source term is modeled as the entrainment of powder in the air flow over the spill. The release fraction data from DOE-STD-3010 (DOE 1994) indicate that the airborne resuspension rate for powder is 4×10^{-5}/hr. The spill is not contained and controlled in a manner such that the spilled material is shielded from the wind for a period of 30 days. Source term decayed to 2095.	Continued Operations Alternative and No Action Alternative.
DBE 21	A criticality during TRUPACT container loading operations	A criticality in an unshielded area of the transport package assembly operations. It is assumed that waste canisters are in a critical geometric configuration, which allows a fissile release of energy.	The radioactive inventory is assumed to be the contents of one TRUPACT shipping container (14 drums). The building and the ventilation system remain intact. 100% of the noble gas fission products, 25% of the iodine radionuclides, and 0.05% of the TRU particulate produced in the event are released directly to the room atmosphere. Source term decayed to 2015.	Continued Operations Alternative, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Minimum INEEL Processing Alternative.

Table C.4-12. Potentially bounding design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 22	A seismic event causes failure of a SBW tank	This scenario is initiated by failure of a pillar-and-panel vault by increased ground acceleration loads, which would result in the breach of the tank within the vaults. This scenario could occur from increased static loads created by a vault failure during an earthquake.	One hundred percent of the contents of the fullest pillar-and-panel tanks is released to the vault. Radioactive inventories in other tanks in the tank farm are not impacted. The vault failure would create an open pathway to subsurface soil with subsequent impact to groundwater. Since the spill is in liquid form, it is assumed that there is great downward mobility. Therefore, there is no airborne release for this scenario. Source term decayed to 2000.	No Action Alternative.
DBE 23	A seismic event causes failure of the SBW packing and preparation facility structure and equipment	This scenario is initiated by failure of the SBW Packing and Preparation Facility by abnormal stress, which would result in the loss of radioactivity containment. This scenario could occur from increased building stress created during an earthquake.	Only one of the 410 containers is ruptured during a seismic event. Radioactive inventories in other containers is assumed to not be impacted. The one ruptured container contains unsolidified borosilicate glass. The building (ISF) failure would create an open pathway to the atmosphere. During normal operation, the contents of the ISF do not have direct access to the environment. Source term decayed to 2015.	Early Vitrification Option.
DBE 24	A seismic event causes failure of the SBW retrieval and transport lines	This scenario is initiated by failure of the SBW retrieval and transport line by seismic stress, which would result in the loss of containment.	Source term developed assuming radioactive inventory is the entire contents of the SBW that is pumped in six hours (3,567 gallons). The transfer line failure would create an open pathway to the atmosphere. During normal operation, the contents of the SBW retrieval and transport system do not have direct access to the environment. Source term decayed to 2015.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-13. Potentially beyond design basis radiological events.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 01	Aircraft crash	This scenario is initiated by an aircraft crash resulting in structural damage to the building and the blend and hold vessel with a subsequent fire.	The blend and hold cell activity data from the NWCF SAR is applicable. The blend and hold cell activity is assumed to be the same as the blend and hold vessel activity. The failure of the blend and hold vessel results from falling debris. The building failure provides a direct release path to the environment. The source term is modeled as a boiling pool of aqueous solutions with corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2000.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Operations Alternative.
BDB 02	Aircraft crash	This accident resulted in a chemical release rather than a radiological release.	NA	NA
BDB 03	Aircraft crash	This scenario is initiated by a crash of a large aircraft into bin set #1. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the vault and bin structures and an ensuing fire in the vault involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage one bin. This damage would occur in such a manner as to allow 10% of the contents to be released to the vault. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the vault occurs, which results in large convection currents to release dust to atmosphere. Source term decayed to 2000.	No Action Alternative, Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 04	Seismically induced failure of the three–high activity waste surge tanks with concurrent HEPA filter failure.	This scenario is postulated to be initiated by a seismic event. This seismic event causes failure of facility structure and equipment such that a release occurs with a direct pathway to the environment. Release of significant quantities of radioactive material could occur along with a significant fire to drive release of materials.	The earthquake damages the three high-activity waste surge tanks (73 m^3 or 19,290 gal each). It is assumed that all 3 of these tanks fail while filled to capacity. The activity/radiological inventory in the high-activity waste surge tanks is the same as the high-activity waste evaporator feed stream. The condition is based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. The organic solutions do not pose an airborne toxic hazard. The subsequent fire and structural damage to the building provide a direct leak path to the environment. The spill results in a large pool of boiling aqueous material. The source term value is appropriate for fires involving boiling aqueous solutions. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. Source term decayed to 2016.	Full Separations Option and Planning Basis Option.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 05	Seismically induced failure of the three-high activity waste surge tanks with concurrent HEPA filter failure.	This scenario is postulated to be initiated by a seismic event that would be powerful enough to create a leakage pathway to the environment. Release of significant quantities of radioactive material could occur along with a significant fire to drive release of materials.	The earthquake damages the three high-activity waste surge tanks (73 m^3 or 19,290 gal each). It is assumed that all 3 of these tanks fail while filled to capacity. The condition is based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. The activity/radiological inventory in the high-activity waste surge tanks is assumed to be the same as the TRUEX strip stream. The organic solutions do not pose an airborne toxic hazard. The subsequent fire and structural damage to the building provide a direct leak path to the environment. The spill results in a large pool of boiling aqueous material. The source term value is appropriate for fires involving boiling aqueous solutions. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. Source term decayed to 2015.	Transuranic Separations Option that requires the transuranic separation process.
BDB 06	Seismically induced failure of both feed tanks with concurrent HEPA filter failure	This scenario is postulated to be initiated by a seismic event that would be powerful enough to create a leakage pathway to the environment. Release of significant quantities of radioactive material could occur along with a significant fire to drive release of materials.	There are two feed tanks for the cesium ion exchange column. It is assumed that both of these tanks fail while filled to capacity. All of the material is spilled from the tanks that are impacted. The subsequent fire and structural damage to the building provide a direct leak path to the environment. The spill results in a large pool of boiling aqueous material. The source term value is appropriate for fires involving boiling aqueous solutions. During normal operation, the building is equipped with active HEPA filtration, which would limit releases from other scenarios to the environment. Source term decayed to 2009.	Continued Operations Alternative and Minimum INEEL Processing Alternative.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 07	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Class C Grout Facility, which results in the loss of radioactive material confinement and a fire in the vault involving ignition of aviation fuel carried by the aircraft.	The entire content of the denitrated solids containment vessel is released to the vault and that 1% of the calcine released to the vault is in the respirable fraction. The ensuing aviation fuel fire causes large convection currents to release material fines into the atmosphere. The vault failure would create an open pathway to the atmosphere. During normal operation, the contents of the Class C Grout Facility do not have direct access to the environment. Source term decayed to 2015.	Transuranic Separations Option and Minimum INEEL Processing Alternative.
BDB 08	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Borosilicate Vitrification Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the melter vault and an ensuing fire in the vault involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage the melter. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the vault occurs, which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of the operating melter, the melter seal pot, and the glass canister. Source term decayed to 2015.	Full Separations Option and Planning Basis Option.
BDB 09	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Borosilicate Vitrification Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the melter vault and an ensuing fire in the vault involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage the melter. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the vault occurs, which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of the operating melter, the melter seal pot, and the glass canister. Source term decayed to 2015.	Early Vitrification Option.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 10	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Waste Packaging Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the wall to still be able to damage the Dispensing Tank. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the facility occurs, which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of the Dispensing Tank and the waste container being filled. Source term decayed to 2011.	Minimum INEEL Processing Alternative.
BDB 11	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the HIP Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into one of the two calcine blending tanks and an ensuing fire in the vault involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage the calcine blending tank. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the vault occurs which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of one of the two calcine blending tanks. Source term decayed to 2015.	Hot Isostatic Pressed Waste Option.
BDB 12	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the DCW Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire in the vault involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage the Static Gravity Mixer. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the facility occurs, which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of the operating Static Gravity Mixer. Source term decayed to 2015.	Direct Cement Waste Option.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 13	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Waste Packaging Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage the Dispensing Tank and the waste container being filled. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel-caused fire within the facility occurs which results in large convection currents to release material to atmosphere. The radioactive inventory is the contents of the Dispensing Tank and a waste container that is being filled. Source term decayed to 2011.	Minimum INEEL Processing Alternative.
BDB 14	Aircraft crash	This scenario is initiated by an aircraft crash resulting in structural damage to the building and the HAW surge tanks with a subsequent fire. A direct leak path to the environment exists.	The released inventory is the volume of three HAW surge tanks (19,290 gallons, each, or 57,870 gallons, total). The activity/radiological inventory in the HAW surge tanks is the same as the HAW Evaporator feed stream. The condition is assumed to be based on evaporator operation when treating dissolved calcine from bin sets #1 and #4. The building breach provides a direct release path to the environment. The source term is modeled as a fire involving large organic pools with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, and Hot Isostatic Pressed Waste Option.
BDB 15	Aircraft crash	This accident resulted in a chemical release rather than a radiological release.	NA	NA

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 16	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the Class C grout transfer line. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the line structures and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	The radioactive inventory is the volume released to the environment during a piping failure that remains undetected for 1 hour (2,000 gallons). Any grout released to the environment solidifies rapidly and this solidification process reduces any off-site consequences significantly. The piping failure results in the wet grout being pumped directly to the surface of the ground, outside of any confinement. Large convection currents release dust to atmosphere. During normal operations, the entire Class C grout transfer system does not have direct access to the environment. Source term decayed to 2015.	Transuranic Separations Option.
BDB 17	Aircraft crash	This scenario is initiated by an aircraft crash resulting in structural damage to the building and a railcar containing four casks (total of 12 canisters) with a subsequent fire.	All four casks in the railcar shipment are impacted. The operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The building breach provides a direct release path to the environment. The inventory data is based on the contents of bin set #1. The source term is modeled as a fire involving powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.
BDB 18	Aircraft crash	This scenario is initiated by an aircraft crash resulting in structural damage to the building and a railcar containing four casks (total of 12 canisters) with a subsequent fire.	All four casks in the railcar shipment are impacted. The operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The building breach provides a direct release path to the environment. The inventory data is based on the contents of bin set #1. The source term is modeled as a fire involving powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 19	Aircraft crash	This scenario is initiated by an aircraft crash resulting in structural damage to the building and a railcar containing four casks (total of 12 canisters) with a subsequent fire.	Only the calcine operation is considered in the source term development. All four casks in the railcar shipment are impacted. The operation is proceeding at the maximum calcine retrieval rate (2,700 kg/hr). The building breach provides a direct release path to the environment. The inventory data is based on the contents of bin set #1. The source term is modeled as a fire involving powder with the corresponding release fraction data from DOE-STD-3010 (DOE 1994). Source term decayed to 2016.	Minimum INEEL Processing Alternative.
BDB 20	Aircraft crash	This scenario is initiated by a crash of a large aircraft into bin set #5. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	The penetration causes an open path to the environment. The engine will retain sufficient kinetic energy upon penetration of the vault to still be able to damage a bin (or bins). This damage would occur to the upper part of a bin because the majority of the bins are below grade. The bin breaches are sufficiently large. Ten percent of the contents of two of the 7 bins are released to the bin set #5 vault and that 40% of the calcine released to the vault is fines. Since the aircraft fuel is contained within the fuselage and wings an aviation fuel caused fire within the vault occurs which results in large convection currents to release calcine dust to the atmosphere. Radiological inventory is based on bin set #5 which has the largest inventory. Source term decayed to 2000.	No Action Alternative and Continued Operations Alternative.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 21	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the RH-TRU Stabilization and Preparation Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	The entire content of one WIPP shipping container is released to the facility. The ensuing aviation fuel fire causes material to be released. The building failure would create an open pathway to the atmosphere. During normal operation, the contents of the RH-TRU Stabilization and Preparations Facility do not have direct access to the environment. Source term decayed to 2015.	Continued Operations Alternative, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Minimum INEEL Processing Alternative.
BDB 22	Aircraft crash	This scenario is initiated by a crash of an aircraft into the tank farm, which would result in the failure of a tank of SBW.	The radioactive inventory is assumed to be the tank containing the largest volume of SBW. The vault tank failure would create a restricted pathway to the atmosphere and no release to groundwater. During normal operation, the contents of the tank farm tanks do not have direct access to the environment. Source term decayed to 2000.	No Action Alternative.
BDB 23	Aircraft crash	This scenario is initiated by a crash of a large aircraft into the RH-TRU Stabilization and Preparation Facility. The accident is assumed to result in the loss of radioactive material confinement caused by penetration of aircraft parts into the facility and an ensuing fire involving ignition of aviation fuel carried by the aircraft.	At the end of 3 years of production, there will be 410 containers in the ISF awaiting transport to WIPP. Only one of these is ruptured during an aircraft crash. The one ruptured container contains liquid unsolidified borosilicate glass. The building (ISF) failure would create an open pathway to the atmosphere. During normal operation, the contents of the ISF do not have direct access to the environment. Source term decayed to 2015.	Early Vitrification Option.

Table C.4-13. Potentially beyond design basis radiological events (continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 24	Flood causes failure of a SBW tank.	This scenario is initiated by a flood, which would result in the loss of the "heel" from one of the five empty SBW tanks to the groundwater. The flood would cause the empty SBW tank to float within its vault.	The flood floats one of the five empty tanks in the tank vaults and that all piping connections to the tanks are severed. It is further assumed that 10% of the tank heels mix with the floodwater in the tank vault and escapes to the environment. The tank failure results in the SBW leaking directly to the surface, outside of the vault. During normal operations, the contents of an empty SBW tank does not have direct access to the environment. Source term decayed to 2015.	Continued Operations Alternative, Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-14. Potentially bounding abnormal events involving release of toxic chemicals.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 02	Kerosene leak through failed process connections	This scenario is initiated by a kerosene spill from a kerosene storage tank caused during fuel loading operations. Although the tanks are double contained, all of the material (15,000 gallons) is assumed to enter the groundwater.	The entire storage tank contents (approximately 15,000 gallons) is released. The entire release enters the groundwater. No radiological inventories are impacted. Since the kerosene storage tanks are stored away from radiological inventories, a fire or explosion involving ignited kerosene would have limited consequences.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Current Operations Alternative.
ABN 04	Ion exchanger toxic release of hydrogen cyanide vapor	This scenario is postulated to be initiated by human error or inadequate procedures during the cleaning or change-out operations associated with the ion exchange resin. This could result in the mixing of strong acid and cyanide compounds and a sudden energetic release of hydrogen cyanide gas within material confinement. Acid decomposition of the resin could liberate hydrogen cyanide gas. Toxic hazards to nearby workers can occur, as well as excessive radiation exposures from volatilized or entrained materials.	Operators take appropriate actions to terminate release of hydrogen cyanide vapor after the incident. The release of hydrogen cyanide vapor would be routed to the INTEC offgas cleanup system that contains an independent high-efficiency particulate air filter system and ensures a long release path to encourage dilution and plate-out of the gas. During normal operation, the offgas from the ion exchange column does not have direct access to the environment.	Full Separations Option and the Planning Basis Option.
ABN 06	Ion exchanger toxic release of hydrogen cyanide vapor	This scenario is postulated to be initiated by human error or inadequate procedures during the cleaning or change-out operations associated with the ion exchange resin. This could result in the mixing of strong acid and cyanide compounds and a sudden energetic release of hydrogen cyanide gas within material confinement. Acid decomposition of the resin could liberate hydrogen cyanide gas. Toxic hazards to nearby workers can occur as well as excessive radiation exposures from volatilized or entrained materials.	Operators take appropriate actions to terminate release of hydrogen cyanide vapor after the incident. The release would be routed to the INTEC offgas cleanup system that contains an independent high-efficiency particulate air filter system and ensures a long release path to encourage dilution and plate-out of the gas. During normal operation, the offgas from the ion exchange column does not have direct access to the environment.	Continued Current Operations Alternative and the Minimum INEEL Processing Alternative.

Table C.4-14. (Continued).

Accident analysis	Title	Description	Assumptions	Applicable alternatives
ABN 15	Ammonia tank failure	This scenario is initiated by a failure of the ammonia tank connections, resulting in a spill of ammonia. A fraction of the ammonia would flash to vapor as it escapes the tank. The remainder would settle and form a boiling pool.	The ammonia storage tank has a volume of 3,000 gallons. Ten percent of the ammonia is spilled from the tank. There is no absorption into the underlying surface and no groundwater impact.	Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-15. Potentially bounding design basis event involving release of toxic chemicals.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
DBE 02	Carbon Bed Filter Fire	A carbon filter bed fire initiates this scenario. Inadequate nitrous oxide destruction in the reduction chamber of the multi-stage combustion system leads to exothermic reactions in the filter bed. The heat buildup could result in a fire and a release of radioactive material (iodine-129) and mercury embedded in the filter bed.	An approximate value for the amount of mercury trapped in the mercury filters is 2,700 kilograms. All of the mercury is assumed to be available for release. Approximately 10 percent of the material is released into the surrounding area. Of that, 10 percent is released to the environment.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Current Operations Alternative.
DBE 15	Ammonia Tank Failure	This scenario is initiated by a catastrophic failure of the ammonia tank resulting in a spill of the entire contents. A fraction of the ammonia would flash to vapor as it escapes the tank. The remainder would settle and form a boiling pool.	The ammonia storage tank has a volume of 3,000 gallons. One hundred percent of the ammonia is spilled from the tank. The material that does not immediately flash to vapor would form a boiling pool; there is no absorption into the underlying surface and no groundwater impact.	Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4.16. Potentially bounding beyond design basis accident involving release of toxic chemicals.

Accident analysis	Title	Description	Assumptions	Applicable alternatives
BDB 02	Aircraft Crash	This scenario is initiated by an aircraft crash resulting in structural damage to both kerosene tanks and a subsequent fire.	The entire inventory in two storage tanks is released (approximately 30,000 gallons). No radiological inventories are impacted. Since the kerosene storage tanks are stored away from radiological inventories, a fire or explosion involving ignited kerosene would have limited consequences. The entire release enters the groundwater, no product is consumed in the resultant fire.	Planning Basis Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, and Continued Current Operations Alternative.
BDB 15	Aircraft Crash	This scenario is initiated by an aircraft crash that fails the ammonia tank. A fraction of the ammonia would flash to vapor as it escapes the tank. The remainder would settle and form a boiling pool.	The ammonia storage tank has a volume of 3,000 gallons. One hundred percent of the ammonia is spilled from the tank. The material that does not immediately flash to vapor would form a boiling pool; there would be no absorption into the underlying surface and no groundwater impact.	Full Separations Option, Planning Basis Option, Transuranic Separations Option, Hot Isostatic Pressed Waste Option, Direct Cement Waste Option, Early Vitrification Option, and Minimum INEEL Processing Alternative.

Table C.4-17. Summary of bounding radiological events for the various waste processing alternatives.

Bounding accident analysis	Process title	Event description	Maximally-exposed individual dose (millirem)	Noninvolved worker dose (millirem)	Offsite population (person-rem)	Latent cancer fatalities to offsite population
		No Action Alternative				
ABN20	Long-Term Onsite Storage of Calcine in bin sets	Bin set system degradation over time results in failure of the outer containment and a portion of the internal containment in a bin set and the possibility of opening a bin set to the environment. Likelihood of this event increases after 2095 when monitoring and maintenance requirements would no longer be met.	170	1.2×10^4	1.3×10^3	0.65
DBE20	Long-Term Onsite Storage of Calcine in bin sets	Seismic failure of a bin set structure and equipment such that a release occurs with a direct pathway to the environment (no interdiction for 30 days).	9,700	6.6×10^5	6.6×10^4	33
BDB20	Long-Term Onsite Storage of Calcine in bin sets	An aircraft crash into a bin set causes failure of the structure and the release of materials from a portion of the internal containment.	420	2.9×10^4	3.5×10^3	1.8
		Continued Current Operations Alternative				
ABN20	Long-Term Onsite Storage of Calcine in bin sets	Bin set system degradation over time results in failure of the outer containment and a portion of the internal containment in a bin set and the possibility of opening a bin set to the environment. Likelihood of this event increases after 2095 when monitoring and maintenance requirements would no longer be met.	170	1.2×10^4	1.3×10^3	0.65
DBE20	Long-Term Onsite Storage of Calcine in bin sets	Seismic failure of a bin set structure and equipment such that a release occurs with a direct pathway to the environment (no interdiction for 30 days).	9,700	6.6×10^5	6.6×10^4	33
BDB20	Long Term Onsite Storage of Calcine in bin sets	An aircraft crash into a bin set causes failure of the structure and the release of materials from a portion of the internal containment.	420	2.9×10^4	3.5×10^3	1.8

Table C.4-17. Summary of bounding radiological events for the various waste processing alternatives (continued).

Bounding accident analysis	Process title	Event description	Maximally-exposed individual dose (millirem)	Noninvolved worker dose (millirem)	Offsite population (person-rem)	Latent cancer fatalities to offsite population
		Full Separations Option				
ABN24	SBW Retrieval and Onsite Transport	Operational error or equipment failure results in structural failure of one of the two SBW receiving tanks in a constructed receiving facility.	5.3×10^{-3}	0.36	0.056	2.8×10^{-5}
DBE04	Full Separation	An organic-oxidant (red-oil) explosion during solvent treatment in the transuranic separation or strontium extraction separations processes, results in release of a significant quantity of radioactive and chemically hazardous material and simultaneous failure of operational confinement.	460	3.2×10^{4}	3.5×10^{3}	1.8
BDB08	Borosilicate Vitrification	An aircraft crash into the facility results in structural failure, process equipment damage, and subsequent fire.	6.8×10^{4}	4.6×10^{6}	6.0×10^{5}	300
		Planning Basis Option				
ABN24	SBW Retrieval and Onsite Transport	Operational error or equipment failure results in structural failure of one of the two SBW receiving tanks in a constructed receiving facility.	5.3×10^{-3}	0.36	0.056	2.8×10^{-5}
DBE01	New Waste Calcining Facility Continued Operations	A calciner vessel explosion due to loss of operational control results in subsequent failure of HEPA filtration and a direct pathway to the environment.	350	2.4×10^{4}	5.9×10^{3}	2.9
BDB08	Borosilicate Vitrification	An aircraft crash into the facility results in structural failure, process equipment damage, and subsequent fire.	6.8×10^{4}	4.6×10^{6}	6.0×10^{5}	300
		Transuranic Separations Option				
ABN16	Class C Grout Disposal	Failure of the above ground grout transport line to the Container Filling, Storage, and Shipping Area.	5.8	390	71	0.035
DBE05	Transuranic Separation	An organic-oxidant (red-oil) explosion, during solvent treatment results in release of a significant quantity of radioactive and chemically hazardous material and simultaneous failure of operational confinement.	1.3×10^{3}	8.6×10^{4}	7.9×10^{3}	4.0
BDB05	Transuranic Separation	An earthquake with subsequent fire causes failure of three high-activity waste surge tanks such that a release occurs with a direct pathway to the environment.	1.3×10^{3}	8.6×10^{4}	7.9×10^{3}	4.0

Table C.4-17. Summary of bounding radiological events for the various waste processing alternatives (continued).

Bounding accident analysis	Process title	Event description	Maximally-exposed individual dose (millirem)	Noninvolved worker dose (millirem)	Offsite population (person-rem)	Latent cancer fatalities to offsite population
		Hot Isostatic Pressed Waste Option				
ABN24	SBW Retrieval and Onsite Transport	Operational error or equipment failure results in structural failure of one of the two SBW receiving tanks in a constructed receiving facility.	5.3×10^{-3}	0.36	0.056	2.8×10^{-5}
DBE01	New Waste Calcining Facility Continued Operations	A calciner vessel explosion due to loss of operational control results in subsequent failure of HEPA filtration and a direct pathway to the environment.	350	2.4×10^{4}	5.9×10^{3}	2.9
BDB14	Liquid Waste Stream Evaporation	An aircraft crash impacts the evaporator process building and releases material in the high-activity waste surge tanks. The fire and crash are assumed to breach the building and provide a direct release path to the environment.	460	3.2×10^{4}	3.5×10^{3}	1.8
		Direct Cement Waste Option				
ABN24	SBW Retrieval and Onsite Transport	Operational error or equipment failure results in structural failure of one of the two SBW receiving tanks in a constructed receiving facility.	5.3×10^{-3}	0.36	0.056	2.8×10^{-5}
DBE01	New Waste Calcining Facility Continued Operations	A calciner vessel explosion due to loss of operational control results in subsequent failure of HEPA filtration and a direct pathway to the environment.	350	2.4×10^{4}	5.9×10^{3}	2.9
BDB12	Direct Cement Waste Immobilization	An aircraft crash into the Direct Cement Waste Facility causes failure of the static gravity mixer.	1.0×10^{3}	7.1×10^{4}	1.1×10^{4}	5.6
		Early Vitrification Option				
ABN24	SBW Retrieval and Onsite Transport	Operational error or equipment failure results in structural failure of one of the two SBW receiving tanks in a constructed receiving facility.	5.3×10^{-3}	0.36	0.056	2.8×10^{-5}
DBE09	Borosilicate Vitrification	A steam explosion occurs in the melter due to intrusion of water into the melt cell, which causes catastrophic failure of the melter and release of vitrified waste material.	1.6	110	14	7.0×10^{-3}
BDB09	Borosilicate Vitrification	An aircraft crash into the facility results in structured failure of the operating melter, seal pot, and the glass canister, and a subsequent fire.	730	50,000	6.6×10^{3}	3.3

Table C.4-17. Summary of bounding radiological events for the various waste processing alternatives (continued).

Bounding accident analysis	Process title	Event description	Maximally-exposed individual dose (millirem)	Noninvolved worker dose (millirem)	Offsite population (person-rem)	Latent cancer fatalities to offsite population
		Minimum INEEL Processing Alternative				
ABN17	High-Level Waste Interim Storage for Transport	A spill of material during canister filling operations with some of the spilled material would be entrained in the ventilation system and be exhausted into the environment.	0.25	17	2.6	1.3×10^{-3}
DBE21	Transuranic Waste Stabilization and Preparation for Transport to Waste Isolation Pilot Plant	Inadvertent criticality during transuranic waste shipping container loading operations as a result of vulnerability to loss of control over storage geometry.	3.0	210	120	0.06
BDB17	High-Level Waste Interim Storage for Transport	An aircraft crash breaches the facility housing and impacts a rail car containing four casks. A subsequent fire could result in the release of the inventory.	4.9×10^{3}	3.4×10^{5}	5.3×10^{4}	26
		Cross-Cutting Accidents				
ABN03	Calcine Retrieval and Onsite Transport	Failure of a transfer line or cyclone housing due to operation error or equipment failure causing direct impact of heavy object such as construction crane.	0.014	0.94	150	0.073
DBE03/20	Calcine Retrieval and Onsite Transport	A flood causes failure of bin set #1 structure and equipment such that a release occurs after 2000 with a direct pathway to the environment.	3.8	260	4.5×10^{4}	22

Table C.4-24. Accident evaluation vs. alternatives/options.

AA	Process Element	No Action Alternative	Continued Operations Alternative	Separations Alternative - Full Separation Option	Separations Alternative - Planning Basis Option	Separations Alternative - Transuranic Separations Option	Non-Separations Alternative - Hot Isostatic Pressed Waste Option	Non-Separations Alternative - Direct Cement Waste Option	Non-Separations Alternative - Early Vitrification Option	Minimum INEEL Processing Alternative
1	NWCF Continued Operation		X		A, B		A, B	A, B		
2	NWCF High Temp & MACT Modifications		E		E		E	E		
3	Calcine Retrieval and On-Site Transport	X	X	F	F	F	F	F	F	F
4	Full Separations			B	B					
5	TRU Separation (TRUEX)					B, C				
6	Cesium Separations (Cs Ion Exchange)		X							X
7	Class C Grout					X				B
8	Borosilicate Vitrification (Cs, TRU, Sr)			C	C					
9	Borosilicate Vitrification (Calcine & SBW)								B, C	
10	HLW/SBW Immobilization for Transport (Calcine & Cs IX)									X
11	HLW/SBW Immobilization for Transport (HIP)						X			
12	HLW/SBW Immobilization for Transport (FUETAP)							C		
13	HLW/SBW Immobilization for Transport (Calcine & SBW)									
14	Liquid Waste Stream Evaporation		C	B	B	X	B, C	B		
15	Additional Offgas Treatment			D	D	D	D	D	D	D
16	Class C Grout Disposal					A				
17	HLW Interim Storage for Transport									A, C
18	HLW/HAW Stabilization and Preparation for Transport									A, C
19	HLW/HAW Stabilization and Preparation for Transport									
20	Long Term On-Site Storage of Calcine in CSSFs	A, B, C	A, B, C							
21	TRU Stabilization and Preparation for Transport to WIPP		X		X	X	X	X		B
22	Long Term On-Site Storage of SBW	E								
23	SBW Stabilization and Preparation for Transport to WIPP								X	
24	SBW Retrieval and On-Site Transport		X	A	A	X	A	A	A, B	X

A Abnormal Events (Radiological)
B Design Basis Events (Radiological)
C Beyond Design Basis (Radiological)
D Bounding Chemical Release Scenario For All Frequency Classes (Note: Other scenarios also involved potential releases of chemicals which could be classified as toxic. However, these releases involved either localized hazards or releases into groundwater. Localized hazards are mitigated by wearing appropriate safety gear when working with potentially toxic materials. Groundwater releases pose a greater long term hazard rather than a short term hazard. In the short term, mitigative measures for groundwater releases can be implemented through evacuation of potentially impacted populations. For these reasons, localized hazards and groundwater releases are not specifically considered in the bounding accident determination
E Bounding Groundwater Releases for all frequency classes
F Bounding abnormal and design basis radiological accident that cross-cuts all active alternatives
X Applicable Scenario

Table C.4-25. Risks from bounding facility accidents for waste processing alternatives.

Frequency category	Bounding accident scenario	Related accident frequency [1/year]	Bounding accident frequency [1/year]	Related window of exposure [years]	Bounding window of exposure [years]	Probability of occurrence [events]	Offsite public dose [rem]	Offsite public LCFs [fat./event]	Additional risk to offsite public [fat.]	Offsite public incr cancer risk [%]	Compared to DOE std
	No Action										
ABN	Degradation and failure of bin set structure and equipment		1.0×10^{-3}[n]		1.0×10^{2}[h,i]	1.0×10^{-1}	1.3×10^{3}	6.5×10^{-1}	6.5×10^{-2}	3.87×10^{-4}[s,t]	3.87×10^{-6}[u]
DBE	Seismic failure of bin set structure and equipment	5.0×10^{-5}	5.0×10^{-4}[k]	1.0×10^{2}	1.0×10^{1}[h,I]	4.0×10^{-2}[r]	6.6×10^{4}	3.3×10^{1}	1.32	7.86×10^{-3}[s,t]	7.86×10^{-5}[u]
BDB	Aircraft crash failure of bin set structure and equipment		2.05×10^{-8}[g]		1.0×10^{2}[h,I]	2.05×10^{-6}	3.5×10^{3}	1.75	3.59×10^{-6}	2.14×10^{-8}[s,t]	2.14×10^{-10}[u]
	Continued Current Operations										
ABN	Degradation and failure of bin set structure and equipment		1.0×10^{-3}[n]		1.0×10^{2}[h,I]	1.0×10^{-1}	1.3×10^{3}	6.5×10^{-1}	6.5×10^{-2}	3.87×10^{-4}[s,t]	3.87×10^{-6}[u]
DBE	Seismic failure of bin set structure and equipment	5.0×10^{-5}	5.0×10^{-4}[k]	1.0×10^{2}	1.0×10^{1}[h,I]	4.0×10^{-2}[r]	6.6×10^{4}	3.3×10^{1}	1.32	7.86×10^{-3}[s,t]	7.86×10^{-5}[u]
BDB	Aircraft crash failure of bin set structure and equipment		2.05×10^{-8}[g]		1.0×102[h,I]	2.05×10^{-6}	3.5×10^{3}	1.75	3.59×10^{-6}	2.14×10^{-8}[s,t]	2.14×10^{-10}[u]
	Full Separations Option										
ABN	Operational failure of SBW retrieval and transport system		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	5.6×10^{-2}	2.8×10^{-5}	1.68×10^{-6}	1.0×10^{-8}[s,t]	1.0×10^{-10}[u]
DBE	Organic oxidant explosion failure of Separations Facility structure and equipment		3.0×10^{-4}[j]		2.0×10^{1}[h]	6.0×10^{-3}	3.5×10^{3}	1.75	1.05×10^{-2}	6.25×10^{-5}[s,t]	6.25×10^{-7}[u]
BDB	Aircraft crash failure of Boro Silicate Facility structure and equipment		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1×10^{-7}	6.0×10^{5}	3.0×10^{2}	1.23×10^{-4}	7.32×10^{-7}[s,t]	7.32×10^{-9}[u]
	Planning Basis Option										
ABN	Operational failure of SBW retrieval and transport system		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	5.6×10^{-2}	2.8×10^{-5}	1.68×10^{-6}	1.0×10^{-8}[s,t]	1.0×10^{-10}[u]
DBE	Calciner explosion failure of New Waste Calcining Facility structure and equipment		1.0×10^{-4}[o]		2.0×10^{1}[h]	2.0×10^{-3}	5.9×10^{3}	2.95	5.9×10^{-3}	3.51×10^{-5}[s,t]	3.51×10^{-7}[u]

Table C.4-25. Risks from bounding facility accidents for waste processing alternatives (continued).

Frequency category	Bounding accident scenario	Related accident frequency [1/year]	Bounding accident frequency [1/year]	Related window of exposure [years]	Bounding window of exposure [years]	Probability of occurrence [events]	Offsite public dose [rem]	Offsite public LCFs [fat./event]	Additional risk to offsite public [fat.]	Offsite public incr cancer risk [%]	Compared to DOE std
BDB	Aircraft crash fails Vitrification Facility structure and equipment		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1×10^{-7}	6.0×10^{5}	3.0×10^{2}	1.23×10^{-4}	7.32×10^{-7}[s,t]	7.32×10^{-9}[u]
	Transuranic Separations Option										
ABN	Operational failure of Class C grout transport system		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	7.1×10^{1}	3.55×10^{-2}	2.13×10^{-3}	1.27×10^{-5}[s,t]	1.27×10^{-7}[u]
DBE	Organic oxidant explosion failure of Separations Facility structure and equipment		3.0×10^{-4}[j]		2.0×10^{1}[h]	6.0×10^{-3}	7.9×10^{3}	3.95	2.37×10^{-2}	1.41×10^{-4}[s,t]	1.41×10^{-6}[u]
BDB	Seismic failure of high-activity waste surge equipment		$5.0\times1^{0-5}$l		2.0×10^{1}[h]	1.0×10^{-3}	7.9×10^{3}	3.95	3.95×10^{-3}	2.35×10^{-5}[s,t]	2.35×10^{-7}[u]
	Hot Isostatic Pressed Waste Option										
ABN	Operational failure of SBW retrieval and transport system		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	5.6×10^{-2}	2.8×10^{-5}	1.68×10^{-6}	1.0×10^{-8}[s,t]	1.0×10^{-10}[u]
DBE	Calciner explosion failure of New Waste Calcining Facility structure and equipment		1.0×10^{-4}[o]		2.0×10^{1}[h]	2.0×10^{-3}	5.9×10^{3}	2.95	5.9×10^{-3}	3.51×10^{-5}[s,t]	3.51×10^{-7}[u]
BDB	Aircraft crash fails evaporator structure and equipment		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1×10^{-7}	3.5×10^{3}	1.75	7.18×10^{-7}	4.27×10^{-9}[s,t]	4.27×10^{-11}[u]
	Direct Cement Waste Option										
ABN	Operational failure of SBW retrieval and transport system		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	5.6×10^{-2}	2.8×10^{-5}	1.68×10^{-6}	1.0×10^{-8}[s,t]	1.0×10^{-10}[u]
DBE	Calciner explosion failure of New Waste Calcining Facility structure and equipment		1.0×10^{-4}[o]		2.0×10^{1}[h]	2.0×10^{-3}	5.9×10^{3}	2.95	5.9×10^{-3}	3.51×10^{-5}[s,t]	3.51×10^{-7}[u]
BDB	Aircraft crash fails Cement Waste Facility structure and equipment		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1x10-7	1.1×10^{4}	5.5	2.26×10^{-6}	1.34×10^{-8}[s,t]	1.34×10^{-10}[u]

Table C.4-25. Risks from bounding facility accidents for waste processing alternatives (continued).

Frequency category	Bounding accident scenario	Related accident frequency [1/year]	Bounding accident frequency [1/year]	Related window of exposure [years]	Bounding window of exposure [years]	Probability of occurrence [events]	Offsite public dose [rem]	Offsite public LCFs [fat./event]	Additional risk to offsite public [fat.]	Offsite public incr cancer risk [%]	Compared to DOE std
	Early Vitrification Option										
ABN	Operational failure of SBW retrieval and transport system		3.0×10^{-3}		2.0×10^{1}[h]	6.0×10^{-2}	5.6×10^{-2}	2.8×10^{-5}	1.68×10^{-6}	1.0×10^{-8}[s,t]	1.0×10^{-10}[u]
DBE	Steam explosion fails Vitrification Facility structure and equipment		1.0×10^{-4}[p]		2.0×10^{1}[h]	2.0×10^{-3}	1.4×10^{1}	7.0×10^{-3}	1.4×10^{-5}	8.33×10^{-8}[s,t]	8.33×10^{-10}[u]
BDB	Aircraft crash fails Vitrification Facility structure and equipment		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1×10^{-7}	6.6×10^{3}	3.3	1.35×10^{-6}	8.05×10^{-9}[s,t]	8.05×10^{-11}[u]
	Minimum INEEL Processing										
ABN	Operations failure in canister filling facility		3.0×10^{-3}[m]		2.0×10^{1}[h]	6.0×10^{-2}	2.6	1.3×10^{-3}	7.8×10^{-5}	4.64×10^{-7}[s,t]	4.64×10^{-9}[u]
DBE	Criticality fails transuranic waste shipping facility structure and equipment		1.0×10^{-5}[q]		2.0×10^{1}[h]	2.0×10^{-4}	1.2×10^{2}	6.0×10^{-2}	1.2×10^{-5}	7.14×10^{-8}[s,t]	7.14×10^{-10}[u]
BDB	Aircraft crash fails railcar storage facility		2.05×10^{-8}[g]		2.0×10^{1}[h]	4.1×10^{-7}	5.3×10^{4}	2.65×10^{1}	1.09×10^{-5}	6.47×10^{-8}[s,t]	6.47×10^{-10}[u]
	Cross-Cut, All Alternatives										
ABN	Impact failure of transfer line, bin set 1 transfer equipment		3.0×10^{-3}[a]		6.0[b]	1.8×10^{-2}	1.5×10^{2}	7.5×10^{-2}	1.35×10^{-3}	8.04×10^{-6}[s,t]	8.04×10^{-8}[u]
DBE	Flood induced failure of bin set during calcine storage	1.0×10^{-6}	1.0×10^{-4}[c,d]	3.8×10^{2}	6.0[e,f]	4.58×10^{-3}[r]	4.5×10^{4}	2.25×10^{1}	1.03×10^{-1}	6.13×10^{-4}[s,t]	6.13×10^{-6}[u]

a. During transfer of calcine from bin set, impact of transfer lines, equipment, temporary storage would produce a release calcine waste, calcine fines, etc. directly to the environment. Scenarios resulting in dropping of a heavy load on transfer equipment or temporary storage are assumed to be dominated by human failures. Catastrophic human failure during transfer operations is assessed as 0.001/activity with 30 activities per year.

b. Transfer of calcine from a single bin set is predicated on estimates of 30 years to remove all calcine waste (7 bin sets), 2 addition years required for the first transfer.

c. Several INEEL specific evaluations of flood frequency support an estimate of 10,000 years as a recurrence frequency for a flood that reaches elevation 4,912, the bottom of the berm surrounding bin set 1. Bin set 1 is known to be statically unstable. To assess the likelihood of bin set failure, it is assumed that a flood reaching the bottom of bin set 1 would liquify the earth surrounding bin set 1 and result in structural failure of the vault. Failure of the vault would result in the bin set lid falling on top of and failing the internal stainless steel bins. Calcine material would then be transported to the environment in flood waters.

d. Conditional failure of bin sets given the occurrence of a flood that reaches 4,912 feet is assumed to be 0.01 or less.

e. DOE intends to remove waste from bin set 1 at the earliest possible date. Therefore the period of vulnerability for bin set 1 flooding is assumed to be 10 years or less.

f. DOE does not intend to remove waste from bin sets 2 through 7 under no action and continued operations scenarios. Period of vulnerability for flooding failure of bin sets 2 through 7 is estimated based on 475 years of remaining useful design life minus 95 years (to 2095) after which mitigation efforts in a flood cannot be assured.

Table C.4-25. Risks from bounding facility accidents for waste processing alternatives (continued).

g. Data from NUREG 800 and military sources agree that the frequency of aircraft impacts decreases with distance from an existing runway, from 1.7×10^{-7}/movement-sq.mi. within a mile of the runway to 1.2×10^{-9}/movement-sq.mi. at 10 miles. After 5 miles the rate of decrease is dramatically less, and it is assumed that the rate beyond 10 miles is asymptotic to 1.0×10^{-9}/movement-sq.-mi. It is assumed that aircraft with sufficient mass to penetrate a bin set land and take off from Idaho Falls airport at a rate of 6 per day or 2,190 movements/year. It is also assumed that INTEC bin sets and other facilities with potentially hazardous inventories occupy approximately 6 acres of exposed land area. Therefore the area over which aircraft induced fires and releases can occur is less than 0.01 sq.-mi.

h. Period of vulnerability for operational or external events threatening INTEC facilities is estimated based on the estimated time the facility is in use, or the time at which the contents of the facility no longer pose a significant offsite hazard.

i. Half lives of strontium-90 and cesium-137 are 27.7 and 30.2 years respectively. Risk from air releases of stored calcine is assumed to be dominated by cesium and strontium release components. Significant risk exists up to the period of time in which Cs decays to < 10% of its existing inventory, a period of 100 years.

j. An oxidant explosion is modeled as a complex set of human errors and equipment failures. Without a systems model, it is difficult to predict a systems based event frequency. Several similar failures have occurred over approximately 1,000 years of reprocessing operations around the world. If the conditional likelihood of a catastrophic explosion is 0.01 the frequency of the event is estimated to be 3×10^{-5}/year.

k. Bin sets 2 through 7, designed to meet STD 1024 criteria, should withstand a 10,000 year earthquake. The frequency of seismic induced failure for bin sets 2 through 7 is estimated using a fragility factor of 2. Division of STD 1024 criteria by 2 provides a measure of the frequency of an earthquake that threatens the integrity of bin sets 2 through 7. Therefore, the frequency of seismic failure for bin sets 2 through 7 is 5×10^{-5}/year. Bin set 1 does not meet STD 1024. An estimate of 5×10^{-4}/year is used for frequency of earthquake induced failure.

l. Same assumptions used to evaluate bin set is used to estimate frequency of seismically induced failure for high-activity waste storage.

m. Frequency of failure is based on likelihood of human or equipment based failure being > 0.01/year and < 0.01/year. A geometric mean of 0.03/year is used.

n. Frequency estimated to be 1×10^{-6}/year for first year of performance period, varying upward to 1 in last year of performance period. Performance period estimated to be 380 years based on 2085 cessation of maintenance and surveillance. Geometric mean of failure frequency, 1×10^{-3} is used to estimate frequency of bin set failure during performance period.

o. Estimate of 1×10^{-4}/year of New Waste Calcining Facility operation for catastrophic failure of calciner cell is estimated using Safety Analysis Report for the facility.

p. Estimate based on vulnerability to catastrophic failure of operational control allowing aqueous material to enter melter cell. 1×10^{-3}/year used to estimate loss of operational control with factor of 10 reduction to catastrophic loss.

q. Estimate based on failure of double contingency criteria given two supposedly independent failures with a frequency of 1×10^{-3}. Factor of 10 increase used to address potential for common cause failure of contingency controls.

r. Where two bounding accident scenarios with the same consequences but different frequencies of occurrence and different windows of vulnerability are defined, risk from both scenarios is evaluated cumulatively.

s. Expected fatalities to the offsite public from a radiological release accident are estimated as the multiple of the total probability of accident occurrence, the resulting population dose, and the conversion 5×10^{-4} latent cancer fatalities per person-rem.

t. Increase in cancer risk from a radiological accident is the ratio of expected additional cancer deaths from the accident to the background cancer rate in a demographic area. Background risk of cancer is estimated based on 500,000 cancer deaths per year in US (population = 250,000,000), an average lifespan of 70 years, and a resident population of 120,000 in the affected area.

u. DOE facility safety assurance criteria as stated in DOE 5480.23 and DOE STD 1027 are designed to ensure that credible radiological and chemical release accidents do not occur more frequently than 1×10^{-6}/year, or contribute more than a 1 in 1,000,000 increase in latent cancers over background.

Table C.4-27. Facility disposition accidents summary.

Facility number	Facility title	Clean closure	Performance	Landfill Stds	Material at risk at closure	Contaminant mobility at closure	Energy for accident at closure	Maximum plausible accident	Bounding operations accident[a]
CPP-601	Fuel Processing Building		●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Radiological: criticality event releasing significant radioactivity to the atmosphere
CPP-604	Waste Treatment Building			●	Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Radiological: criticality event releasing significant radioactivity to the atmosphere
CPP-605	Blower Building			●	Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Chemical release due to ammonia gas explosion in the former NO_x Pilot Plant during New Waste Calcining Facility testing
CPP-627	Remote Analytical Facility		●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Radionuclide spill in the CPP-627 cave; classified as an abnormal event
CPP-640	Head End Process Plant		●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Transfer cask criticality initiated by addition of water moderator to 24 Rover fuel tubes
CPP-659	New Waste Calcining Facility		●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Crane drops or equipment malfunctions during decontamination or demolition activities	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operations Alternatives
CPP-666 and 767	Fluorinel Storage Facility and Stack	●	●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Criticality event in Spent Nuclear Fuel Storage Area
CPP-684	Remote Analytical Laboratory		●		Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	High winds disperse residual contaminants freed during routine demolition activities	Failure of CPP-684 containment releasing entire contents of Analytical Cell

Table C.4-27. Facility disposition accidents summary (continued).

Facility number	Facility title	Clean closure	Performance	Landfill Stds	Material at risk at closure	Contaminant mobility at closure	Energy for accident at closure	Maximum plausible accident	Bounding operations accident[a]
CPP-1618	Liquid Effluent Treatment & Disposal Building	●			Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Explosion in fractionator releasing radioactivity to the atmosphere
CPP-708	Main Stack			●	Low levels of radioactive and hazardous material	Low mobility potential for contaminants affixed to surfaces or trapped in inaccessible locations	Low energy sources due to gradual disassembly of stack	Accidental drop of stack segment during disassembly	Main stack toppled westward by earthquake, crushing CPP-756 prefilters and CPP-604 offgas filter
CPP-713	Vault for Tanks VES-WM-187, 188, 189, and 190	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the tanks with Class C grout or clean fill material	Low energy sources during SBW retrieval, removal of combustible materials, and routine dispositioning	Rupture or break in the SBW transfer lines during SBW retrieval operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-729	Bin set #1	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-742	Bin set #2	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-746	Bin sets #3	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives

Table C.4-27. Facility disposition accidents summary (continued).

Facility number	Facility title	Clean closure	Performance	Landfill Stds	Material at risk at closure	Contaminant mobility at closure	Energy for accident at closure	Maximum plausible accident	Bounding operations accident[a]
CPP-756 and 649	Prefilter Vault and Atmospheric Protection System Building			●	Low levels of radioactive and hazardous material residue after cease-use removal activities	Low mobility ensured by pipe capping and installation of a site protective cover during closure activities	Low energy sources due to routine closure activities and removal of combustible materials	Accidental fire during demolition activities could release contaminants beyond the working area	Fire that begins in prefilters and spreads to all 104 final HEPA filters, releasing radioactivity to the atmosphere
CPP-760	Bin set #4	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-765	Bin set #5	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-780 through CPP-786	Vaults for Tanks VES-WM-180-186	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the tanks with Class C grout or clean fill material	Low energy sources during SBW retrieval, removal of combustible materials, and routine dispositioning	Rupture or break in the SBW transfer lines during SBW retrieval operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-791	Bin set #6	●	●	●	Low levels of radioactive and hazardous material	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives
CPP-795	Bin set #7	●	●	●	Very low levels of radioactive and hazardous material; bin sets did not contain calcine	Low mobility ensured by pipe capping and filling the bin sets with Class C grout or clean fill material	Low energy sources during Calcine Retrieval and Transport Project, removal of combustible materials, and routine dispositioning	Rupture or break in the calcine transfer lines during Calcine Retrieval and Transport operations	Flood-induced failure of bin sets, the design basis event for calcine storage in No Action and Continued Current Operation Alternatives

a. In addition to the "bounding operational scenario" for *radiological and hazardous material releases* shown in the last column of this table for all the facilities, the following bounding accident scenario for *hazardous chemical releases* should be included for all facilities, except CPP-605. As described in the introduction of this facility analysis, the bounding accident scenario for *hazardous chemical releases* is a catastrophic failure of a 3,000-gallon ammonia tank and formation of cloud of toxic vapor. This chemical accident postulated during INTEC-wide operations has the greatest potential consequences to workers and the off-site population.